End of Year Worksheet Name _____
FST
SHOW ALL WORK!!! Date _____

This worksheet is going to give you a list of problems that I would like you to complete in preparation for the final. All of the problems are located in your textbook. There is one problem from each section we have seen throughout the year. This list will not cover every single topic from the year. This should help guide you to where you need to be to get yourself ready for the final. Write your solutions on lined paper.

Realize that there are 95 problems on this worksheet. In class, get as many of these done as you can. For homework tonight, try to get as far as you can through the second column. The remainder of the problems will be homework for Thursday night. It is important that you get through these problems, as you end of year review will be based on what you remember to do and what you don't remember. Also, I encourage you to work through problems not listed here. Remember, you have the entire textbook, wikipage, old worksheets, Progress Self-Tests, and Chapter Reviews to help prepare for the final.

1-1: 20
1-2: 5
1-3: 1
1-4: 6
1-5: 14
1-6: 13, 14
1-7: 14
2-1: 18
2-2: 15
2-3: 8
2-4: 12
2-5: 13
2-6: 13
2-7: 14
2-8: 11
3-1: 13
3-2: 16
3-3: 11
3-4: 14
3-5: 14
3-6: 10
3-7: 21
3-8: 14
3-9: 10
4-1: 19
4-2: 13
4-3: 20
4-4: 12, 13
4-5: 13
4-6: 9
4-7: 13
4-8: 7-9
4-9: 9
4-10: 10
5-1: 13
5-2: 12
5-3: 5 – 10
5-4: 8
5-5: 6 – 11
5-6: 15
5-7: 10
6-1: 17
6-2: 14
6-3: 9 – 12
6-4: 6 – 11
6-5: 9
6-6: 3 – 6
7-1: 15
7-2: 16
7-3: 12
7-4: 12
7-5: 8
7-6: 12
7-7: 9
8-1: 15
8-2: 11
8-3: 4
8-4: 13
8-5: 7 – 9
8-6: 17
8-7: 12
8-8: 15
8-9: 13
9-4: 11, 12
9-5: 11
9-8: 15 – 17
9-9: 7

1-1: Tables and Graphs

- What is statistics?
- What is data?
- What is a variable?
- What is population?
- What is a sample?
- What is a survey?
- What is a random sample?
- What three questions should you ask yourself when looking at a table or graph?
- Know how to read and create a bar graph and circle graph.

1-2: Stemplots and Dotplots

- What is meant by the distribution of data?
- What is a stem-and-leaf plot (i.e. what are the parts of it)?
- What are the maximum, minimum, and range of data?
- What are clusters and gaps?
- What is a back-to-back stemplot?
- What is the frequency of an item or event?
- What is a dotplot or dot-frequency diagram?

1-3: Measures of Center

- What is the summation notation?
- What is the symbol Σ, and what is it used for?
- How is an index used in summations?
- What is the mean and how is its symbol?
- What is the summation notation of the mean?
- What is the median?
- What is the mode?
- What do we call the collection of the mean, median, and mode?

1-4: Quartiles, Percentiles, and Box Plots

- What is a quartile?
- What are the first, second, and third quartiles?
- Why are there only three quartiles?
- What is the interquartile range?
- What values are presented in the five-number summary?
- What is a percentile and how do you calculate it?
- What is a box plot/box-and-whisker plot?
- How do you construct a box-and-whisker plot?
- What is an outlier?
- How do you find an outlier?
- Be able to construct a box-and-whisker plot by hand and using your calculator.

1-5: Histograms

- What is a histogram?
- What is a frequency histogram?

- What is a relative frequency histogram?
- What is the difference between a histogram and a regular bar graph?
- What does it mean to have a skewed histogram?
- Be able to construct a histogram by hand and using your calculator.

1-6: Choosing a Good Display

- What is time-series data?
- What is a scatterplot?
- What is a line graph?
- What is the average rate of change, and how do you find it?
- When is the data increasing and decreasing on a graph?
- With all of these different types of graphs that we have, how do you know which to use?

1-7: Variance and Standard Deviation

- What is deviation?
- What is variance?
- What is standard deviation?
- Be able to calculate the variance and standard deviation by hand and using your calculator.
- What are the formulas for variance and standard deviation? Why do you really only need to know the formula for one to know the other?

2-1: The Language of Functions

- What is univariate data?
- What is bivariate data?
- What is a mathematical model?
- What is a relation?
- What is a variable?
- What is the independent variable?
- What is the dependent variable?
- What is a function?
- What variable does the domain deal with? Range?
- What is the vertical line test?
- How do you pronounce "Euler?"
- What is the argument of a function?

2-2: Linear Models and Correlation

- What is a linear function?
- What is the line of regression?
- Be able to find the regression line using a graphing calculator.
- What is the correlation coefficient?
- What are positive and negative relations?
- What is a perfect correlation?
- When is the correlation strong? Weak?

2-3: The Line of Best Fit

- What are observed values?
- What are predicted/expected values?
- What are errors and deviations in predictions?
- What is the line of best fit?
- What is the method of least squares?
- What is the center of gravity of a set of data?
- What is interpolation?
- What is extrapolation?

2-4: Exponential Functions

- What is an exponential function?
- What is exponential growth?
- What is exponential decay?
- Why is it important to know the properties of exponential functions (there are 8 of them)?
- What is the difference between strictly increasing and strictly decreasing?
- What is an asymptote?

2-5: Exponential Models

- What is an exponential model?
- What is the initial value?
- What is the growth factor?
- Be able to find the exponential model in your graphing calculator.
- What is the doubling time?
- What is half-life (and don't say, "A video game.")?

2-6: Quadratic Models

- What is a quadratic model?
- What is a quadratic, and what are the characteristics of quadratics?
- What are the values we use for acceleration due to gravity?
- Be able to find a quadratic model in your graphing calculator.
- What are impressionistic models?

2-7: Step Functions

- What is a step function?
- What is the greatest integer function?
- What else is the greatest integer function called, and why?
- What does discontinuous mean?
- What is a point of discontinuity?
- What does it mean to have a continuous graph?
- What is the rounding-up function (and what else is it called)?

2-8: Choosing a Good Model

- What does residual mean?
- Why is it important to know the characteristics of the different graphs?

3-1: Changing Windows

- What is a transformation?
- What is the viewing window?
- What is the default window?
- How do you make sure your calculator shows all of the information that you want it to?

3-2: The Graph-Translation Theorem

- What is a translation image?
- What is a preimage?
- What is a translation?
- What is the Graph-Translation Theorem?

3-3: Translations of Data

- What is a translation of data?
- What happens to the measures of central tendency when you add a value h to each number in a data set?
- What does not change when you add a value h to each number in a data set?
- What does invariant mean?

3-4: Symmetries of Graphs

- What does it mean to be reflection-symmetric?
- What is the axis or line of symmetry?
- What does it mean to be 180°-rotation-symmetric?
- What is the center of symmetry?
- What lines can you reflect over?
- What does it mean to be symmetric with respect to the x-axis?
- What does it mean to be symmetric to the origin?
- When is a function an even function?
- When is a function an odd function?
- How do you use the Graph-Translation Theorem to find symmetries?

3-5: The Graph Scale-Change Theorem

- What happens in a vertical scale change?
- How do you spell "vertical?"
- What happens in a horizontal scale change?
- What is a horizontal scale factor?
- What is a vertical scale factor?
- What is a size change?
- What is the Graph Scale-Change Theorem?
- What do negative scale factors do to a graph?

3-6: Scale Changes of Data

- What happens in a scale change of data?
- What is the scale factor?

- What is the scale image?
- What happens to the measures of central tendency when you multiply each element in a set by a scale factor?
- What happens to the measures of spread when you multiply each element in a set by a scale factor?

3-7: Composition of Functions

- What is a composition of functions?
- What is the domain of a composition $g \circ f$?
- What happens when you reverse the order of a composition?

3-8: Inverse Functions

- What is an inverse of a function?
- What is the Horizontal-Line Test?
- What is the Inverse Function Theorem?
- What is the identity function?

3-9: *z*-Scores

- What is a *z*-score?
- What are the properties of *z*-scores?

4-1: Measures of Angles and Rotations

- What is a sine wave?
- What makes up an angle?
- What is the measure of an angle?
- What is the difference between a positive and negative revolution?
- What are the two units we use to measure angles?
- What does a radian measure?
- Be able to convert between degrees, radians, and revolutions.

4-2: Lengths of Arcs and Areas of Sectors

- What is an arc?
- What is the Circular Arc Length Formula?
- What is a disk?
- What is the sector of a circle?
- What is the Circular Sector Area Formula?
- What measure does the central angle need to be for the two formulas above?

4-3: Sines, Cosines, and Tangents

- What is the unit circle?
- On a unit circle, what does $\cos\theta$ represent?
- On a unit circle, what does $\sin\theta$ represent?
- What does $(\cos\theta, \sin\theta) = R_\theta(1,0)$ represent?
- What is the measure, in radians, of θ for a semicircle?
- There are four "basic" points on a unit circle. What are the coordinates for these four points, both in degrees and radians?

- How do you find $\tan\theta$?
- How do you switch your calculator between degree and radian mode?
- Know what the sign of $\cos\theta$, $\sin\theta$, and $\tan\theta$ for the different quadrants.

4-4: Basic Identities Involving Sines, Cosines, and Tangents

- What is an identity?
- What is the Pythagorean Identity?
- What is the Opposites Theorem?
- What is the Supplements Theorem?
- What is the Complements Theorem?
- What is the Half-Turn Theorem?

4-5: Exact Values of Sines, Cosines, and Tangents

- Be able to determine the exact values of the sine, cosine, and tangent.
- How does "3-2-1" help you with the unit circle?

4-6: The Sine, Cosine, and Tangent Functions

- What is the sine function?
- Know the exact values and approximate decimal values of various values of $\sin\theta$.
- What is the cosine function?
- Know the exact values and approximate decimal values of various values of $\cos\theta$.
- What is the tangent function?
- Know the exact values and approximate decimal values of various values of $\tan\theta$.
- What are the circular functions?
- What does periodic mean?
- What is the period of a function?
- What is the Periodicity Theorem?

4-7: Scale-Change Images of Circular Functions

- What is a sine wave?
- What is the amplitude of a wave?
- How do you find the amplitude of a sine or cosine function?
- How do you find the period of a sine or cosine function?
- What is the frequency of a periodic function?

4-8: Translation Images of Circular Functions

- What is a phase shift?
- What is a vertical shift?
- What is the phase shift for making a sine function a cosine function?

4-9: The Graph-Standardization Theorem

- What is a rubber band transformation?
- What is the Graph-Standardization Theorem?
- How do you find the phase shift in a sine or cosine function?

- How do you find the vertical shift in a sine or cosine function?

4-10: Modeling with Circular Functions
- What does oscillating mean?
- What kind of a graph does an oscillating function give?

5-1: Trigonometric Ratios in Right Triangles
- What is trigonometry?
- What are the trig functions?
- What are the trig ratios?
- How do we remember the trig ratios?
- What is the angle of depression?
- How many minutes are in a degree? Seconds in a minute?
- Know how to switch between degrees and degrees, minutes, and seconds.

5-2: The Law of Cosines
- What is the Law of Cosines?
- What's the tough part about working with the Law of Cosines?

5-3: The Inverse Cosine Function
- Why do we have to restrict the domain of $y = \cos x$?
- What is the domain for $y = \cos x$?
- What is the inverse cosine function?

5-4: The Law of Sines
- What is the SAS Area Formula for a Triangle?
- What is the Law of Sines?

5-5: The Inverse Sine Function
- Why do we have to restrict the domain of $y = \sin x$?
- What is the domain for $y = \sin x$?
- What is the inverse sine function?

5-6: The Inverse Tangent Function
- Why do we have to restrict the domain of $y = \tan x$?
- What is the domain for $y = \tan x$?
- What is the inverse tangent function?

5-7: General Solutions to Trigonometric Equations
- What is a trigonometric equation?
- What is the general solution to a trigonometric equation?
- How can we solve trig equations with quadratic form?

5-8: From Washington to Beijing
- What is a great circle?
- What is a meridian?

- What is the Greenwich/Prime Meridian?
- What is the International Date Line?
- How do you find distances between points on the same longitude?
- How do you find distances between points on the same latitude?
- What is the Spherical Law of Cosines?
- How do you find distances between any two points on a sphere?

6-1: n^{th} Root Functions

- What is an n^{th} root?
- How do you find the number of real roots of a function?
- What is the Power of a Power Property?
- What is an n^{th} root function?
- What is a radical?
- How can you define the n^{th} root as a radical? As a power?

6-2: Rational Power Functions

- What is the Rational Exponent Theorem?
- What is the Product of Powers Property?
- What is the Power of a Product Property?
- What is the Quotient of Powers Property?
- What is the Power of a Quotient Property?
- What is the Zero Exponent Theorem?
- What is the Negative Exponent Theorem?
- When do you know when you have completed a power problem?
- What is a rational power function?

6-3: Logarithm Functions

- What is a logarithm of x to the base b?
- Okay, so what *really* is a logarithm?
- What is a common logarithm?
- What is a logarithm function with base b?
- There are 7 properties listed that apply to logarithms. Be familiar with them.

6-4: e and Natural Logarithms

- What is the compound interest formula?
- How does compound interest relate to e?
- Who is the number e named after?
- What is e out to 5 decimal places?
- What is the Continuous Change Model?
- What is the exponential function with base b?
- What is a natural logarithm?
- What is a natural logarithm function?

6-5: Properties of Logarithms

- What is the Logarithm of 1?
- What is the Logarithm of a Product?

- What is the Logarithm of a Quotient?
- What is the Logarithm of a Power?

6-6: Solving Exponential Equations
- What is an exponential equation?
- What is the Change of Base theorem?

6-7: Linearizing Data to Find Models
- What does it mean to "linearize" data?

7-1: Basic Principles of Probability
- What do probabilities measure?
- What is probability theory?
- What is an experiment?
- What are outcomes?
- What is the sample space of an experiment?
- What is an event?
- How do you determine the probability that an event occurs?
- What is a fair experiment?
- What is a biased experiment?
- What are the basic properties of probability (3 parts)?

7-2: Addition Counting Principles
- What is a union?
- What does it mean to have sets that are disjoint or mutually exclusive?
- What is an intersection?
- What is the addition counting principle (mutually exclusive)?
- What is the probability of the union of mutually exclusive events?
- What is the addition counting principle (general form)?
- What is the probability of a union of events (general form)?
- What are complementary events?
- How do you find the probability of complements?

7-3: Multiplication Counting Principles
- What is the multiplication counting principle?
- How do you determine the possible arrangements of selections with replacement?
- What is a factorial?
- How do you determine the possible arrangements of selections without replacement?

7-4: Permutations
- What is a permutation?
- How do you determine the number of permutations of n elements?
- What is the formula for finding the permutations of n objects taken r at a time?
- Why does $0! = 1$?

7-5: Independent Events

- What are independent events?
- What are dependent events?

7-6: Probability Distributions

- What is a random variable?
- What is a probability distribution?
- How do you calculate the mean or expected value μ?

7-7: Designing Simulations and 7-8: Simulations with Technology

- What is a simulation?
- What is the Monte Carlo method?
- What are some ways to generate random numbers?
- Where do you find the probability simulations in your graphing calculator?

8-1: Formulas for Sequences

- What is a sequence?
- Describe what a term and its position are.
- What is the difference between an explicit and a recursive formula?
- What is an arithmetic sequence?
- What are the explicit and recursive formulas for arithmetic sequences?
- What is a geometric sequence?
- What are the explicit and recursive formulas for geometric sequences?

8-2: Limits of Sequences

- What is a limit?
- What is the notation for a limit?
- What is meant by end behavior?
- What does is mean to be divergent?
- What does it mean to be convergent?
- What is the harmonic sequence?
- What is the alternating harmonic sequence?
- Know all 7 of the limit properties.

8-3: Arithmetic Series

- What is a series?
- What is an infinite series?
- What is a finite series?
- What is an arithmetic series?
- What are the explicit and recursive formulas for the sum of any arithmetic series?

8-4: Geometric Series

- What is a geometric series?
- What is the formula for a geometric series?

8-5: Infinite Series

- What is the definition for S_∞?
- When is a limit convergent?
- When is a limit divergent?
- With an infinite geometric series, we can tell whether it converges or diverges. How?

8-6: Combinations
- What is a combination?
- What is the formula for a combination?
- What is the difference between a permutation and a combination?

8-7: Pascal's Triangle
- What is Pascal's Triangle?
- What are the five properties of Pascal's Triangle?

8-8: The Binomial Theorem
- What is the binomial theorem?
- How do we apply the binomial theorem?

8-9: Binomial Probabilities
- What is a binomial experiment?
- What is the binomial probability theorem?
- What is a binomial probability distribution?

9-4: Division and the Remainder Theorem
- How do you divide polynomials using long division?
- What is the Remainder Theorem?

9-5: The Factor Theorem
- How are zeros of a polynomial related to the factors of a polynomial?
- What is the factor Theorem?
- What is the Factor-Solution-Intercept Equivalence Theorem?

Synthetic Division
- What is synthetic division?

9-8: Factoring Sums and Differences of Powers
- How do you factor polynomials?
- What is the Sums and Differences of Cubes Theorem?
- What is the Sums and Differences of Odd Powers Theorem?

9-9: Advanced Factoring Techniques
- How do you factor polynomials?

13-1: The Secant, Cosecant, and Cotangent Functions
- How do you calculate secant, cosecant, and cotangent?